SOME HYMENOSOMIDAE FROM THE SWAN RIVER.

By STEPHEN K. MONTGOMERY, B.A., B.Sc.

(*Read* 13*th April*, 1920.)

About October of 1919, Mr. W. B. Alexander, M.A., sent me some little crabs which had been caught in fishing nets in the Swan River, and had been sent to him by the Fisheries Department. These were found on examination to belong to the species *Hymenosoma australe* of Haswell, described by him as a new species in his "Catalogue of Australian Malacostraca, 1882." The only locality there given is Williamstown, Port Phillip.

Later, about March, 1920, further examples of the family Hymenosomidae were obtained, some from the boat sheds on the Swan River, other from dredge hauls in the Narrows.

Mr. Alexander had never met these crabs before, and none has been received hitherto by the Museum. This is, therefore, as far as can be ascertained from the available literature, the first record of the species from Western Australia. The only mention of the family which can be found from this State is in records of the "Challenger" Expedition, in E. J. Mier's report on the Decapoda Brachyura, he there mentions a small specimen from King George's Sound, as probably *Halicarcinus ovatus*.

The genus *Hymenosoma* is one about which there has been considerable difference of opinion. Not only is the whole family *Hymenosomidae* of uncertain affinities, but also there is difficulty in dividing up the various genera composing it. The view of Miers is that among other genera there are three closely related, namely *Hymenosoma* (Leach), *Halicarcinus* (White), and *Hymenicus* (Dana), separated from one another by small but definite points of difference. *Hymenosoma* and *Halicarcinus* are the only ones with which this note is concerned. Miers distinguishes the latter from the former by the following characters:—"The carapace is more transverse and rounded, less distinctly triangulate. The front is distinctly trilobated. The basal segment of the abdomen in the male occupies the whole width of the sternum, between the bases of the fifth ambulatory legs. The exterior maxillipedes (in the typical species at least) are more robust, and more strongly developed, with the palms more turgid, and the dactyli of the ambulatory legs are more distinctly falcated."—(Miers.)

Professor W. A. Haswell, however, says (loc. cit.):—"The subdivision of this family (*Hymenosomidae*) into the genera *Hymenosoma*, *Hymenicus*, and *Halicarcinus* appears to be unnecessary and based on extremely slight points of distinction, and I have therefore placed all the species under Leach's original genus." In accordance with this view, he therefore describes his

new genus as *Hymenosoma australe*. His description reads, "Carapace sub-orbiculate, the length (exclusive of the rostrum) a little less than the greatest breadth. Rostrum prominent, deflexed, its upper surface concave from side to side, bordered laterally by a raised ridge, which terminates near the extremity in a slight enlargement; extremity in the form of an obtuse angle. Lateral borders of the carapace with two obscure teeth. Chelipedes of the male extremely large, propodos dilated, smooth, rather sharp edged below, fingers gaping at the base, with a projecting pulvinus. Chelipedes of female small, hand not dilated, fingers straight; length half an inch."

The specimens which Mr. Alexander sent were five males, and coincided well with the description and figure of Haswell. The pulvinus on the cheliped of the majority of these specimens was far better developed than is shown in his figure.

It will be noted, however, that if Mier's view of the three distinct genera is taken, several points in Haswell's description point to *Halicarcinus* rather than *Hymenosoma*. For example, the shape of the carapace is sub-orbiculate not triangulate; and in the specimens under discussion this also holds. Again, the typical *Hymenosoma* has the front "simple, triangulate, and nearly horizontal"; the specimens, though Haswell's description fits them, have also, as in *Halicarcinus*, the front "distinctly trilobated." Haswell's description and the specimens also point to *Halicarcinus* rather than *Hymenosoma* with regard to the shape and size of the chelipedes. In other points also they come under the genus *Halicarcinus*; there is a distinct epistome which is transverse, the exterior maxillipedes are stout and the dactyli of the ambulatory legs are not straight, though the curvature is certainly slight.

If Mier's view is accepted, therefore, we are compelled to regard these specimens as *Halicarcinus* rather than *Hymenosoma*. In this case, Haswell's specific name must be kept, and the species referred to as *Halicarcinus* (White), *australe* (Haswell).

Of the other specimens, those from the boat sheds are one female and one male, and are in all respects similar to those sent by Mr. Alexander, except that the chelipedes of the male specimen are very small and like those of the female, though the typical pulvinus is present.

The specimens from the Narrows are quite different. They are smaller, being not more than 0·2 inch long, and the grooving of the carapace, which is most marked in the other specimens is hardly present at all. The carapace is triangulate, the front simple, triangulate, and horizontal, and the exterior maxillipedes are slender; all three characters place the specimen, according to Miers, under the genus *Hymenosoma*. On the other hand, the epistome, though indistinct, is certainly present, and the dactyli of the ambulatory legs are quite strongly curved. The character

of the chelipedes and of the basal segment of the post-abdomen is of no value in the case of these specimens, as all are females.

At first, considering the differences in size and the fact that the two sets of specimens came from the same locality, it seemed probable that the latter specimens were merely young stages of the former, and that the differences were merely growth changes ; in other words, that Haswell's opinion was the correct one, that the two genera, *Hymenosoma* and *Halicarcinus*, were not to be distinguished. But all the small specimens, which were all females, were sexually mature and were carrying eggs ; and it is hard to believe that the crabs would grow nearly three times as large after reaching sexual maturity. The probability is, therefore, that in these smaller specimens we have another genus, *Hymenosoma*, if we follow Miers in making a distinction, or, at any rate, if we follow Haswell, another species, not *H. australe*. Miers mentions Haswell's combination of the genera in both his "Challenger" Brachyura Report, and his memoir on the Crustacea collected by H.M.S. "Alert," but without comment in each case. Access to any further literature on the subject has been impossible, and an opinion on the advisability of separating the genera would not be justified.

A further problem presents itself with regard to the affinities of the *Hymenosomidae* with other families. Generally they are considered as relations of those families formerly grouped as Catometopa (generally distinguished by a typically square carapace) and are placed most nearly with the Pinnoteridae or Pea-crabs, the Mictyridae, and the Plagusiidae. Ortmann, according to Alcock (Materials for a Carcinological Fauna of India, No. 6, pp. 282 and 291), removes them entirely from the Catometopa, and allies them with the Oxyrhyncha, or Spider-crabs, which are, in general, provided with a triangular carapace and a sharp frontal spine or rostrum. The characters of the two tribes are stated as follows by Alcock (*Loc. cit.*) :—

Catometopa.—"The carapace is variable, but commonly and typically it is transverse, more or less quadrate, with large branchial and small and indistinct hepatic regions and a broad front. The front is also variable in form but typically is much deflexed.

The orbits, typically, occupy the whole or the greater part of the anterior border of the carapace on either side of the front. The typical fold of the antennules is transverse, but it may be oblique, or nearly vertical, and in a few cases there are no distinct fossae at all into which these appendages can fold.

The epistome, typically, is extremely short, but occasionally it is of considerable length. The buccal orifice is typically, but by no means always square cut. The palp of the external maxillipedes usually articulates either at the summit, or at or near the external angle of the merus.

The genital ducts of the male usually perforate the sternum, opposite the last pair of legs, ...

The abdomen of the male is very often narrow at its base and so does not cover all the space between the last pair of legs.

The branchiae are often fewer than nine, from eight to six on either side, their efferent channels open on either side of the palate."

Oxyrhyncha.—" Carapace more or less narrowed in front, and usually produced in the form of a rostrum, branchial regions considerably developed, hepatic regions small. Epistome usually large, buccal cavity quadrate, with the anterior margin straight. Branchiae almost always nine on either side ; their efferent channels open at the sides of the endostome or palate. Antennules longitudinally folded. The palp of the external maxillipedes is articulated either at the summit or the antero-internal angle of the meropodite. The external genitalia of the male are inserted at the bases of the fifth pair of trunk legs."

In the specimens here recorded, the shapes of the carapace and the front recall the Oxyrhyncha rather than the Catometopes, as do also the extent of the orbits and the fold of the antennules, which is longitudinal. The character of the epistome varies in the family but its absence in some is more like a Catometope character than an Oxyrhynch. The articulation of the palp of the external maxillipede is near the summit of the merus, but nearer the antero-internal angle than otherwise ; this favours the Oxyrhynch view. The external genitalia appear to perforate the sternum and not to arise at the base of the fifth pair of trunk legs ; this inclines towarded the Catometope. The branchiae are apparently seven, as in many Catometopes. It is seen, therefore, that the family cannot be put in either tribe with certainty. Miers and Alcock take them as Catometope, the latter considering Ortmann's view, " a decided mistake." Mr. L. A. Borradaile, of Cambridge, follows Ortmann, but his paper is not available ; Mr. T. Douglas Laurie, of Liverpool, refers to them on opposite pages of the same paper, once in conjunction with Catometope families, and again under the Oxyrhyncha ; and Miss M. J. Rathbun, of Washington, describes a *Halicarcinus* as an Oxyrhynch, in her report on the Crustacea taken by the Mawson South Polar Expeditition, but in her list of the Brachyura collected by Mr. Stanley J. Gardiner, in the " Sealark," she places them between the Catometope families and the Oxyrhyncha, making, apparently, aseries of the Plagusiidae, *Hapalocarcinidae*, *Hymenosomidae*, and the Inachidae, the first group of the Oxyrhyncha.

This note has been put forward with two objects, one to place on record the occurrence of this family in the Swan River, and the other to indicate the nature of the problems in carcinology which await solution, and the impossibility of dealing with them effectively without good collections and the necessary literature.